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red mites attached to the posterior extremity, not very unlike those often seen about the roots of the wings of grasshoppers, except that these were smaller. These also interfere greatly with the reproduction of the species. I am not aware of any other instance where a perfect Coleopterous insect is so infested with *Tachina* parasites. A much larger species has been bred from maggots found in the larva of the Colorado potato bug.

ANIMAL LIFE IN THE ROCKY MOUNTAINS OF COLORADO.

BY PROF. W. H. BREWER.

IN the summer of 1869, I accompanied the Harvard Mining School Expedition to the Rocky Mountains, under Professor J. D. Whitney, and during the trip, I made some notes that may be worth putting on record, although very imperfect from my ignorance of the specific characters of the animals.

Our explorations were principally in the region about South Park, Colorado, and along the crest extending to beyond the head waters of the Arkansas, and north to Gray's Peak. The altitude of those parts of South Park where we spent most time is from 9,600 to 9,900 feet. I was on the following peaks in fine weather, and on some of them more than once.

Gray's Peak, 14,145 feet; Irwin's Peak, about the same height; Mt. Lincoln, 14,123 feet; Horse Shoe, 13,806 feet; Silverheels, 13,650 feet; Mount Yale, 14,078, besides numerous points over 11,000 feet. (Mt. Harvard, the highest point of the Rocky Mountains, 14,270 feet, was ascended by other members of the party on a very unfavorable day.)

On these peaks, the limit of tree vegetation, as had been already shown by Dr. Parry, is a little over 11,000 feet, and on all the peaks named, there were considerable masses of snow at the time of our visit, which was from the middle of July to the first of September.

In South Park, deer are abundant. Elk were occasionally seen (we saw but three). Mountain sheep are found on the ridges

which extend into the Park, and on all the peaks around, particularly above the limits of tree vegetation their trails were very common, and their traces abundant to the summits of the less known peaks. The streams in the Park abound in trout.

Buffalo are said to have been abundant in South Park, and adjacent mountains previous to 1862; then came the rush of miners, when the buffaloes were speedily exterminated. A few were shot in 1867; one was said to have been shot (near Pike's Peak) in 1868; but we heard of none in 1869. They were frequently described to me as a marked variety known to the hunters as *Mountain* buffalo, and quite unlike the buffalo of the plains, smaller in size, the hair longer, more shaggy, and blacker, with other well-marked differences.* I found their skulls up to 11,000 feet, both in the grassy valleys (called *parks*) and in the forests. All the skulls seen were smaller than those common on the plains.

Grizzly Bears are quite common, and range to above 13,000 feet at this season. Six were seen above this altitude on Gray's Peak and Mt. Yale, and their traces seen in other places. Judging from the few seen, and from skins examined in Denver, they are smaller than those of California, the hair not so long and shaggy, the color more silvery, or truly *grizzled*, than with the Californian animals.

Coleoptera were wonderfully sparse compared with any other region I ever saw, this applying not only to the portions of the mountains visited but also to the plain near the base of the mountains. I always carried a bottle of strong alcohol in my pocket for preserving such as I found but the collection was a ridiculously small one. It is probable, however, that a skilled collector would have been more successful. But few were collected feeding upon herbage, the most being scavenger beetles, found by examining the dung or dead bodies of animals. Some of these latter were found at an altitude of more than 13,000 feet, but they were few.

On the high Sierras of California certain herbivorous beetles are found abundantly; on the summits of similarly high peaks in Colorado they were looked for, but not one was found.

Lepidoptera were very abundant above the forest line, particularly on sunny slopes at 12,000 or 13,000 feet, and where there was an abundant alpine vegetation. In such localities they were vastly more numerous than I ever saw them in similar situations

* See Mr Hayes' remarks on this subject on p. 118.—EDS.

in the high Sierra Nevada. The kinds most abundant in individuals were specifically (and, I think, even generically) distinct from the more abundant butterflies of the High Sierras. They ranged up to the highest points visited, but were most abundant both in species and individuals above the forest line, but below the exposed rocky summits, flying near the ground, very agile, alighting often, and after short low flights, and concealing themselves in the low herbage, their concealment being more easily effected, as well as more effectual, from the brilliancy of the alpine flowers, which constitute a marked feature of these heights.

Crickets are very abundant, several species are found at 12,000 to 13,000 feet, and in favorable localities the number of individuals is very large; some are very brightly colored.

The most striking feature of insect life, however, there, is the number of grasshoppers. They are numerous at all altitudes visited, and to me appeared to embrace a number of species, of which at least two ranged to the highest points. They fly much more than our eastern species, both as regards the length and height of their flight, and on warm days they fill the air, even to the highest summits. If they chance to alight or fall on the snow, they soon become chilled, and perish there in numbers that challenge belief until seen. It is no exaggeration to say that *tons* of them may be seen. When large snowbanks melt in the summer, the number of dead grasshoppers left on the rocks is so large, that the stench caused by their decay often pollutes the air for a great distance. At altitudes of about thirteen thousand feet, the conditions are most favorable for this to take place, and we saw frequent examples. Mr. Bowles speaks several times of the abundance of grasshopper life. I quote but one passage:—

“The only life was grasshoppers,—here they were still, by thousands, by millions, sporting in the air and frisking over the snow, but the latter’s chill seemed soon to overcome their life, for they lay dead in countless numbers on its white surface. In some places the dead grasshoppers could have been shovelled up by the bushels, and down at the edges of the snow, cold grasshopper soup was to be had *ad libitum*. There was a feast here for the bears, but we could see none enjoying it.” (Parks and Mountains of Colorado, p. 93.)

The day (August 4th) I was upon Mount Lincoln (14,123 feet) was very clear during the three and a half hours we were on the summit. It is well known that by shading the actual disk of

the sun, and looking into the atmosphere very near it, solid particles in the air can be seen most plainly, and doing this at that place, the air seemed filled with grasshoppers in flight, myriads of them, extending high enough to appear as the finest specks, even with a field-glass. They certainly ranged some hundreds of feet above that summit in immense numbers. An occasional butterfly was seen also on the summit, but they were few.

Several species of flies are peculiarly abundant at 8,000 to 12,000 feet, which at times nearly set our animals frantic, but the most voracious kinds were troublesome only when the sun shone—even a passing cloud would drive them out of sight.

REVIEWS.

THE GENESIS OF SPECIES.*—Among the works called out by Darwin's epoch-making work, as the Germans happily style it, the present volume stands preëminent. It is a series of criticisms by a thorough evolutionist, and one who was originally a Darwinian. It will interest the general reader, the style being clear and attractive, and the spirit of the author thoroughly candid and calm. The author is well known in scientific circles by his original papers on the anatomy of certain of the vertebrates.

The object of the book is "to maintain the position that 'Natural Selection' acts, and indeed must act, but that still, in order that we may be able to account for the production of known kinds of animals and plants, it requires to be supplemented by the action of some other natural law or laws as yet undiscovered." Farther on he says "The view here advocated, on the other hand, regards the whole organic world as arising and going forward in one harmonious development similar to that which displays itself in the growth and action of each separate individual organism."

He thus sums up the difficulties against Darwinism, or the doctrine of "survival of the fittest" maintaining:—

* On the Genesis of Species. By St. George Mivart, F.R.S. London. Macmillan & Co. 1871. 12mo, pp. 296. With numerous wood cuts. \$2.00